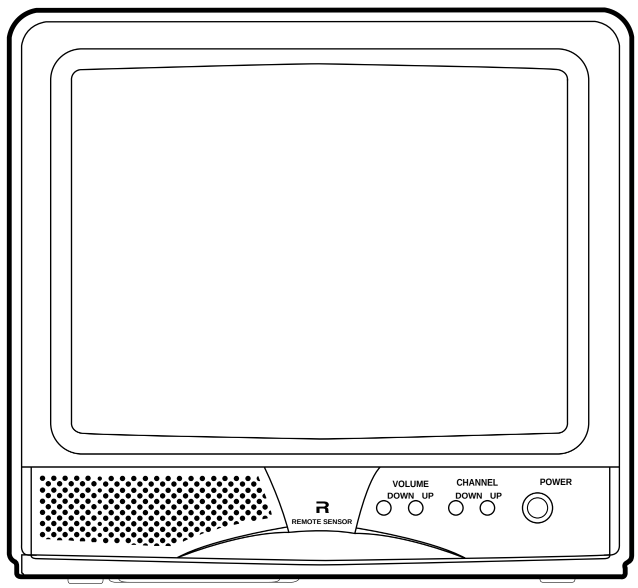
Service Manual

MT1130C

13” Color Television



THIS SERVICE MANUAL IS FOR MT1130C SUFFIX A , B , C AND D CRT USAGE

	SUFFIX A	SUFFIX B	SUFFIX C	SUFFIX D
V451	5721-014ST37N (37GDA86X)	5721-37CN030T (370KSB22(SYB))	5721-026TT37N (A34JFQ90X)	5721-030ZT37N (A34JXV70X)
DY501	4993-117	4993-052	4993-110	4993-124

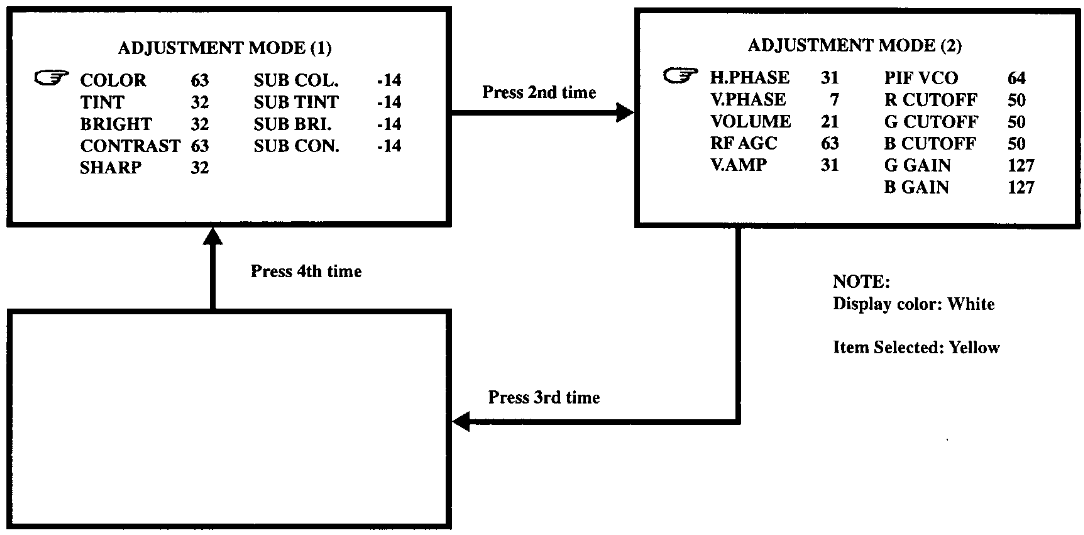
Memorex®

ADJUSTMENT MODE

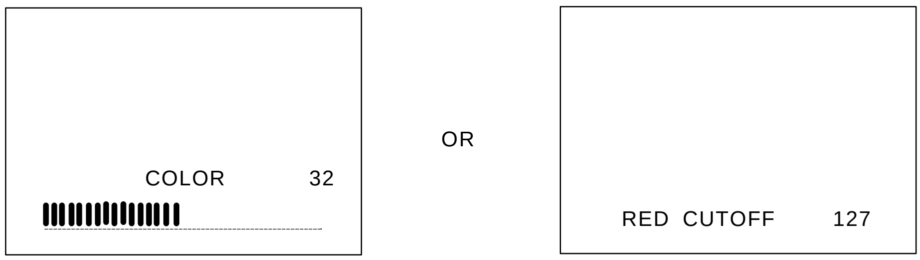
The following adjustment items can be performed from menus by Remote Control as shown below :

NOTE: The button combination and position on the Remote Control to select the adjustment items is given on page 4.

1. Press the SHIFT + ADJ. MODE buttons on the Remote Control simultaneously to bring up the adjustment mode menu screens shown below.



2. From the menu screen, press the + or - button on the Remote Control to select the item to be adjusted.
3. Press the MENU button on the Remote Control to enter adjustment mode for the item selected, and the display shown below appears :

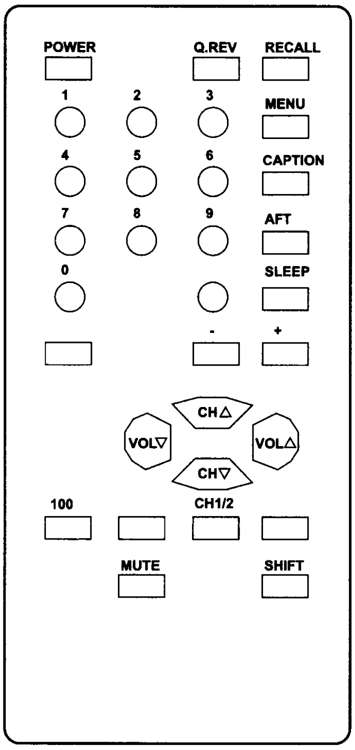


Example:

4. Use the + or - button on the Remote Control to adjust the data for the item selected.
5. When adjustment has been completed, press the SHIFT + ADJ. MODE buttons on the Remote Control simultaneously to return to the main menu.

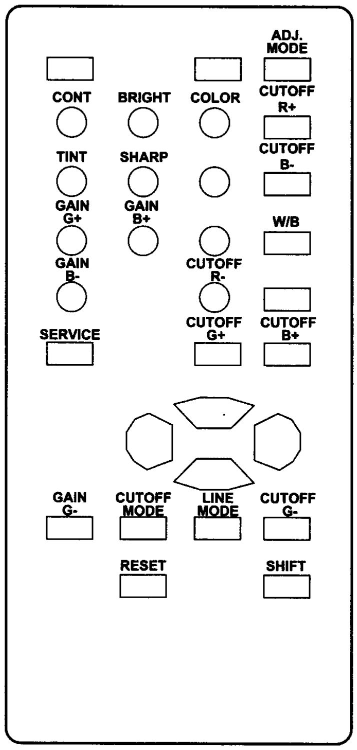
REMOTE CONTROL LAYOUT

NORMAL MODE LAYOUT
(WITHOUT SHIFT KEY)



ONLY PRESS THE SELECTED ITEM BUTTON

SPECIAL MODE LAYOUT
(SHIFT + SELECTED ITEM)



MUST PRESS SHIFT + SELECTED ITEM BUTTON

METHOD OF RECALL V-BLOCK PASS NUMBER

If user forgets the V-Block Pass Number, call recall by the Service Remote Control or User Remote Control.

1. If use the Service Remote Control, at the Pass Number entry menu, while holding down [SHIFT] button and press the [Q.REV] button repeatedly four times.

2. If use the User Remote Control, at the Pass Number entry menu, while holding down [VOLUME DOWN] button on the TV set and press number [3] button on the remote control repeatedly four times.

3. The blinking “?” will be replaced with “!” after each press.

4. Release the [SHIFT] button or [VOLUME DOWN] button and then press [MENU] button. “V-BLOCK SET” menu will be appearing on-screen with the user setting pass number.

IC, TRANSISTOR AND CRT COMPLEMENT

INTEGRATED CIRCUITS

IC101 TA87C-B6	Microcomputer	IC501 AN5512	Vertical Deflection Output
IC102 CAT24CO4	EEPROM	IC601 STR30130	AVR
IC301 TA1268N	IF/Video/Chroma/Deflection	IC671 NJ7805LD	Voltage Regulator and Reset
IC311 NJ7809FA	Voltage Regulator		

TRANSISTORS

Q101 DTC143ZS	Vertical Synchronizing	Q452 2SC1473A(R)	Blue Color Driver
Q102 2SC945(P)	Horizontal Synchronizing	Q453 2SC1473A(R)	Green Color Driver
Q173 2SC945(P)	SD Signal Buffer	Q551 2SC1473A(R)	Horizontal Driver
Q301 2SC945(P)	SIF Signal Buffer	Q552 2SD 1 877	Horizontal Driver
Q302 2SA733(P)	Video Buffer Amplifier	Q601 2SC945(P)	Power On/Off Relay Driver
Q303 2SC945(P)	Video Out	Q801 2SC945(P)	Audio Amplifier
Q351 DTC143ZS	Service Mode Switching	Q802 2SA950(0)	Audio Amplifier
Q451 2SC1473A(R)	Red Color Driver	Q803 2SC2120(0)	Audio Amplifier

PICTURE TUBE

V451	37GDA86X	CRT (SUFFIX A)	V451	A34JFQ90X	CRT (SUFFIX C)
V451	370KSB22(SYB)	CRT (SUFFIX B)	V451	A34JXV70X	CRT (SUFFIX D)

CHASSIS REMOVAL

1. Remove 4 screws (183) from Cabinet Back (AB) and remove Cabinet Back from rear.
2. Discharge anode lead at CRT chassis ground through a 10kohm resistor.
3. Disconnect anode lead from CRT.
4. Disconnect CRT Socket P.C. board (PCB-2) from CRT(V451).
5. Disconnect 3 connectors (CN501 (DY501), CN601 (L601) and LCN801) from Main P.C. board (PCB-1).
6. When replacing chassis, reverse the above procedure making certain that all leads are fastened in their original places.

CRT REMOVAL

CAUTION: Wear shatterproof goggles and exercise proper handling precautions when working around high vacuum picture tubes.

1. Remove chassis per instructions under CHASSIS REMOVAL.
2. Remove Convergence Magnet Assembly (MG451) from neck of CRT.
3. Remove Deflection Yoke (DY501) from neck of CRT
4. Remove 3 wedges (158) from CRT
5. Remove Degaussing Coil (L601) from CRT
6. Remove braid wire (331) and spring (157) from CRT
7. Lay cabinet face down on some protective material.
8. Remove 4 CRT mounting screws (174).
9. Remove CRT from Cabinet Front (AA).
10. To install new CRT, reverse above procedure.
11. Perform purity and convergence adjustments.

CAUTION: Use an isolation transformer when performing any service on this chassis.

SHUTDOWN CIRCUIT: When the high voltage rises, there are simultaneous voltage increase developed at terminal 6 of the Horizontal Output Transformer (T671) and applied to pin 29 of IC301. If excessive high voltage is produced, the increased voltage developed exceeds the rating of zener diode D552 causing the Horizontal Oscillator to stop functioning and the high voltage system to shut down.

AFT (AUTOMATIC FINE TUNING) ADJUSTMENT

1. Connect TV Test Pattern Generator (NTSC signal, Monoscope signal, 70dBu, channel 2) to EXT. Antenna Terminal (TE1) through TV Channel Signal Generator.
2. Connect wire (+) of DC Digital Voltmeter to TP6 and wire (-) to TP4. (Figure 1)
3. Adjust T202 so that the DC Digital Voltmeter reading is 2.0V ± 0.1V.

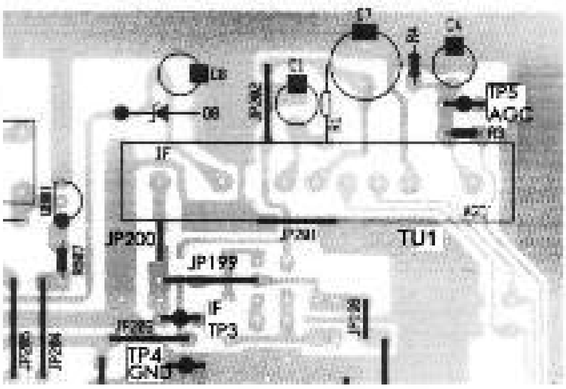


FIG. 1

SUB COLOR AND SUB TINT ADJUSTMENT

1. Connect TV Test Pattern Generator (NTSC signal, Color Bar signal, 70dB u , channel 6) to EXT. Antenna Terminal (TE1) through TV Channel Signal Generator.
2. Connect positive lead of Oscilloscope to TP14 and negative lead to TP10.
3. Set Tint control to center position. (by Remote Control).

(NOTE: For steps 4, 5 and 6 below, refer to page 3 for Adjustment By Remote Control Method).

4. Go to Adjustment Mode (1) by remote control.
5. Select SUB COLOR and SUB TINT from Adjustment Mode (1) menu screen.
6. Adjust SUB COLOR and SUB TINT level (by using + or - button on remote control) so that waveform 1 & 4 (for SUB COLOR) and waveform 2 & 3 (for SUB TINT) is the same as shown in Figure 2.

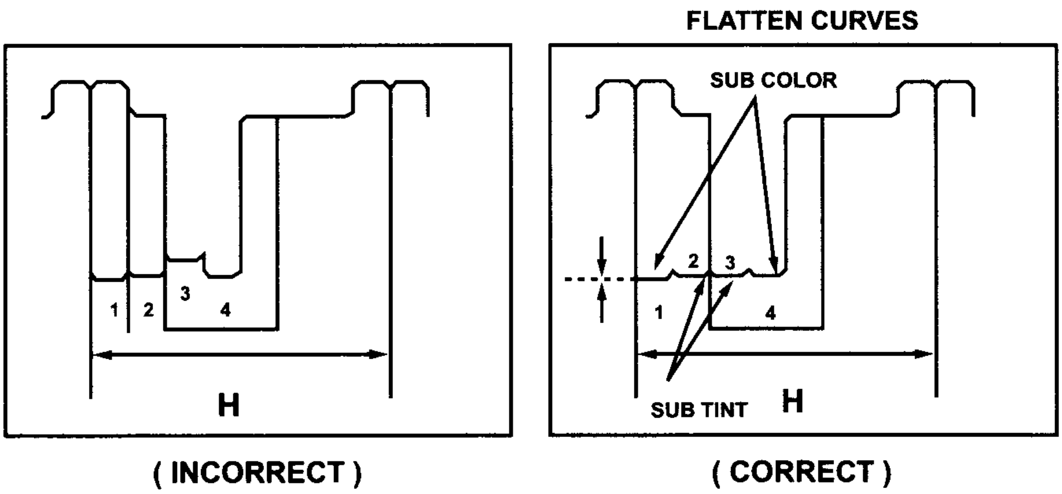


FIG. 2

SOUND IF ADJUSTMENT

1. Connect TV Test Pattern Generator (NTSC signal, 70dB u , channel 2) to EXT. Antenna Terminal (TE1) through TV Channel Signal Generator. (Standard modulation is 400Hz at 25kHz deviation for sound signal.
2. Connect positive lead of DC Digital Voltmeter to TP7 and negative lead to TP9.
3. Adjust T203 so that the DC Digital Voltmeter reading is 4.0V.

COLOR PURITY ADJUSTMENT

For best results, it is recommended that the purity adjustment be made in the final receiver location. If the receiver will be moved, perform this adjustment with it facing East.
The receiver must have been operating 15 minutes prior to this procedure and the face plate of the CRT must be at room temperature. The following procedure is recommended while using a Dot/Bar Generator.

1. Check correct location of all neck components. (Refer to Figure 3)
2. Rough -in the static convergence at the center of the CRT, as explained in the static convergence procedure.
3. Set the Contrast control to minimum position and Brightness control as far maximum as possible without causing the picture to “bloom”.
4. Apply green raster signal from Dot/Bar Generator to receiver.
5. Loosen the deflection yoke clamp screw and pull the deflection yoke toward the rear of the CRT.
6. Begin the following adjustment with the tabs on the round purity magnet rings set together. Slowly separate the two tabs while at the same time rotating them to adjust for a uniform green vertical band at the center of the CRT screen.
7. Carefully slide the deflection yoke forward to achieve green purity (Uniform green screen).
   NOTE: Center purity is obtained by adjusting the tabs on the round purity magnet rings. Outer edge purity is obtained by sliding the deflection yoke forward.
8. Check for red and blue field purity by applying red and blue raster signal alternately from Dot/Bar Generator to receiver. Repeat steps 2 through 7, if required.
9. Tighten deflection yoke clamp screw.
10. Perform BLACK AND WHITE ADJUSTMENT procedure.

(CW : clockwise, CCW : counterclockwise)

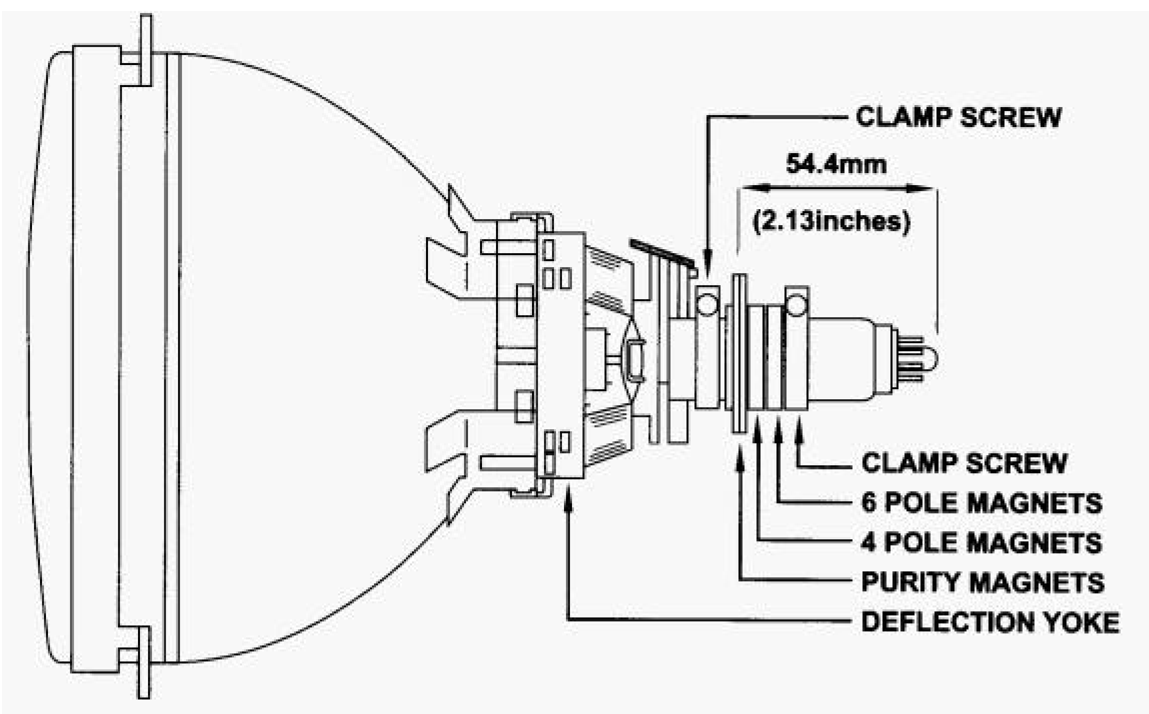


FIG. 3

STATIC CONVERGENCE ADJUSTMENT (Refer to Figure 3 and 4)

IMPORTANT: Before proceeding, make sure the location of the convergence magnet assembly on the neck of the CRT is as shown in Figure 3. The rear edge of this assembly must be positioned 65 mm from the tip of the CRT base. If not properly positioned, convergence adjustment may be difficult, if not impossible.

1. Apply dot or crosshatch pattern from Dot/Bar Generator to receiver. Reduce setting of Brightness and/or Contrast controls to eliminate any blooming in pattern.
2. Observe the blue and red pattern appearing on the CRT screen. Locate the 4 pole magnet rings and separate their adjusting tabs approximately the width of one tab.
3. Now rotate this pair of magnet rings as a unit without re-adjusting the spacing between the tabs. This will minimize the separation between the blue and red dots (lines).
4. If the blue and red dots are not completely converged at this point, readjust the spacing between the two tabs to complete convergence of the blue and red dots (lines), thus producing magenta dots (lines).
5. If necessary, repeat step 2, 3 and 4 until proper convergence is achieved.
6. Observe the magenta (B/R) and green pattern now appearing on the CRT screen.
7. Locate the 6 pole magnet rings and separate their adjusting tabs approximately the width of one tab.
8. Rotate this pair of magnet rings as a unit without re-adjusting the spacing between the tabs. This will minimize the separation between the magenta (B/R) and green dots (lines).
9. If the magenta and green dots (lines) are not completely converged at these points, readjust the spacing between the two tabs to complete convergence of the magenta and green dots (lines).
10. If necessary, repeat step 7, 8 and 9 until proper convergence is obtained.

    To prevent accidental mis-adjustment of the magnets, apply a stripe of paint across all six rings and onto the neck of the CRT.

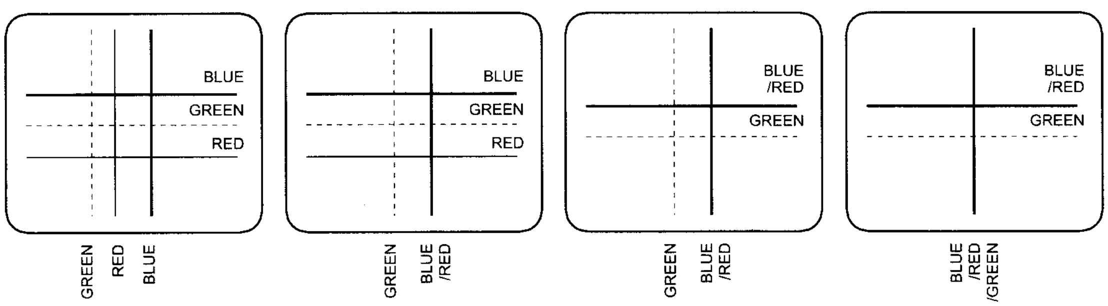


FIG. 4

DYNAMIC CONVERGENCE ADJUSTMENT (Refer to Figure 5)

Dynamic convergence (convergence of the three edges of the CRT screen) is accomplished by proper insertion and positioning of three rubber wedges between the edges of the deflection yoke and funnel of the CRT. This is accomplished in the following manner.

1. Turn the receiver ON and allow it to warm up for 15 minutes.
2. Apply crosshatch pattern from Dot/Bar Generator to receiver. Observe spacing between lines around edges of CRT screen.
3. For the misconvergence shown in Figure 5 (A), tilt the deflection yoke down and insert wedge A between deflection yoke and CRT.
4. For the misconvergence shown in Figure 5 (B), tilt the deflection yoke up and insert wedge B between deflection yoke and CRT.
5. For the misconvergence shown in Figure 5 (C), tilt left side of the deflection yoke and slightly insert wedge C between deflection yoke and CRT. Then, deeply insert wedges A and B between deflection yoke and CRT.
6. For the misconvergence shown in Figure 5 (D), tilt right side of the deflection yoke and deeply insert wedge C between deflection yoke and CRT. Then, slightly insert and/or extract wedges A and B between deflection yoke and CRT.
7. Alternately change spacing between and depth of insertion of the three wedges until proper dynamic convergence is obtained.
8. Use a strong adhesive tape to firmly secure each of the three rubber wedges to the funnel of the CRT.

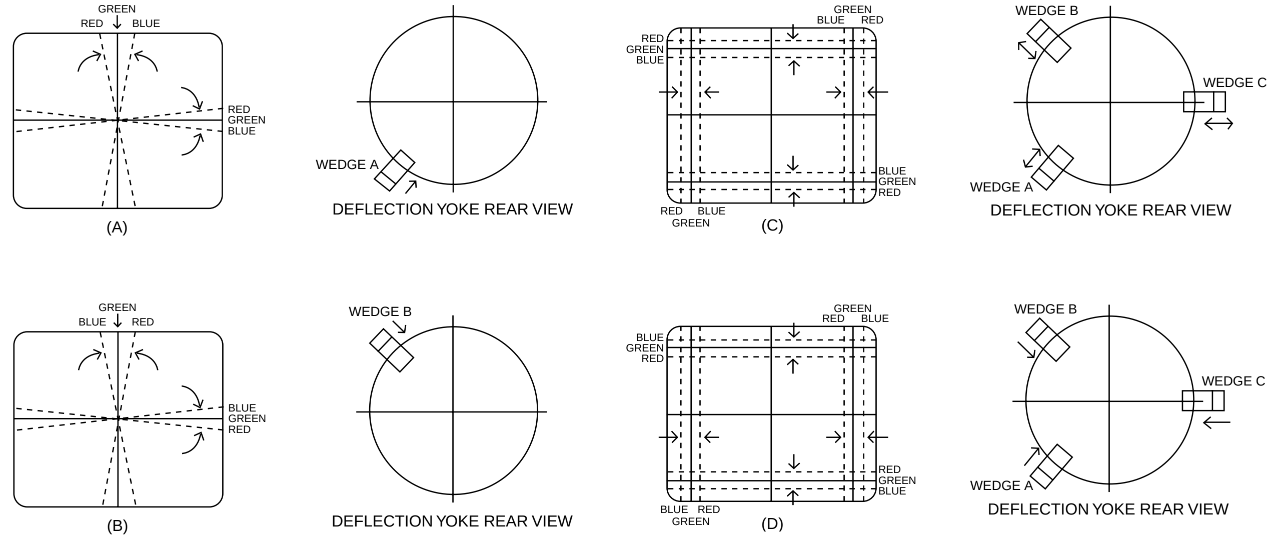


Fig. 5

FOCUS ADJUSTMENT

Adjust focus control, located on the Horizontal Output Transformer (T671), for maximum overall definition and fine picture detail with Brightness and Contrast controls set at normal viewing levels.

BLACK AND WHITE ADJUSTMENT (CUTOFF / WHITE BALANCE)

The purpose of this procedure is to adjust the bias applied to the color picture tube for reproducing a quality monochrome picture at all brightness levels and also to achieve maximum usable brightness. Confirm that proper purity and AGC adjustments have been completed before starting this adjustment.

1. Connect the TV test pattern generator (Monoscope pattern) to the EXT. antenna terminal via TV VHF/UHF signal generator (NTSC signal, 70dB u).
2. Select Cutoff Mode by remote control, (refer to page 4 for remote control key combination and position) and CUT OFF will be displayed on top-right screen for about 3 seconds. At the same time the data readings for Cutoff and Gain in Adjustment Mode (2) will become as follows:
   R CUTOFF: 50, G CUTOFF: 50, B CUTOFF: 50, G GAIN: 127, B GAIN: 127
3. Select Service Mode by remote control, (refer to page 4 for remote control key combination and position) and TV screen becomes horizontal line.
4. Turn the Screen control (located under the flyback transformer) clockwise until any blue, green or red color line appears.
5. Check the color of the line which appeared first, then turn the Screen control (located under the flyback transformer) fully counterclockwise.
6. Adjust the cutoff level of the color which appeared first by remote control, (refer to page 4 for remote control key combination and position) so that voltage between TP16 and TP15 (blue), TP14 (green) or TP13 (red) is 20 ± 1V.
7. Turn the Screen control (located under the flyback transformer) clockwise so that the bright color line can just be seen.
8. Adjust cutoff levels other than the above by remote control, (refer to page 4 for remote control key combination and position) so that the line color is white.
9. Press again Service Mode key by remote control, (refer to page 4 for remote control key combination and position) to return to TV position. Monoscope pattern will appear on TV screen.
10. Adjust the contrast and brightness controls to make the picture dim. Adjust the Green and Blue Cutoff levels by remote control, (refer to page 4 for remote control key combination and position) so that the picture is white.
11. Adjust the contrast and brightness controls to make the picture bright. Adjust the Green and Blue Gain levels by remote control, (refer to page 4 for remote control key combination and position) so that the picture is white.
12. Repeat steps 10 and 11 so that the picture is white in both dim and bright conditions.

HORIZONTAL PHASE ADJUSTMENT

1. Connect TV Test pattern Generator (NTSC signal 70dB u, Monoscope Pattern) to Antenna Terminal (TE) through TV Channel Generator.

(NOTE: For steps 2, 3 and 4 below, refer to page 3 for Adjustment By Remote Control Method).

2. Go to Adjustment Mode (2) by remote control.
3. Select H. PHASE from Adjustment Mode (2) menu screen.
4. Adjust H. PHASE level (by using + or - button on remote control) so that horizontal reading of test pattern becomes the same value.

VERTICAL PHASE ADJUSTMENT

1. Connect TV Test pattern Generator (NTSC signal 70dB u, Monoscope Pattern) to Antenna Terminal (TE) through TV Channel Generator.

(NOTE: For steps 2, 3 and 4 below, refer to page 3 for Adjustment By Remote Control Method).

2. Go to Adjustment Mode (2) by remote control.
3. Select V. PHASE from Adjustment Mode (2) menu screen.
4. Adjust V. PHASE level (by using + or - button on remote control) so that vertical reading of test pattern becomes the same value.

VERTICAL AMPLITUDE ADJUSTMENT

1. Connect TV Test pattern Generator (NTSC signal 70dB u, Monoscope Pattern) to Antenna Terminal (TE) through TV Channel Generator.

(NOTE: For steps 2, 3 and 4 below, refer to page 3 for Adjustment By Remote Control Method).

2. Go to Adjustment Mode (2) by remote control.
3. Select V. AMP from Adjustment Mode (2) menu screen.
4. Adjust V. AMP level (by using + or - button on remote control) so that picture fills the picture opening from top to bottom and is proportionate to the width.

RF AGC ADJUSTMENT

1. Connect TV Channel Signal Generator to Antenna Terminal (TE).
2. Connect positive lead of DC Digital Voltmeter to TP5 and negative lead of DC Digital Voltmeter to TP4.
3. Adjust level of TV Channel signal Generator so that the output level is 57dB u. (Monoscope Pattern)

(NOTE: For steps 4, 5 and 6 below, refer to page 3 for Adjustment By Remote Control Method).

4. Go to Adjustment Mode (2) by remote control.
5. Select RF AGC from Adjustment Mode (2) menu screen.
6. Adjust RF AGC level (by using + or - button on remote control) so that the DC Digital Voltmeter reading is 6.0V ± 0.2V.

SUB BRIGHTNESS ADJUSTMENT

1. Connect TV Test Pattern Generator (NTSC signal, Color Bar Signal, 70dB u) to EXT. Antenna Terminal through TV Channel Signal Generator.

(NOTE: For steps 3, 4 and 5 below, refer to page 3 for Adjustment By Remote Control Method).

2. Go to Adjustment Mode (1) by remote control.
3. Set the COLOR and CONTRAST of the TV set to minimum and the SUB CONTRAST and SUB BRIGHT to '0' (using + or - button on remote control).
4. Adjust SUB BRIGHT level (by using + or - button on remote control) to obtain a dim pattern. (Refer to Fig.6)

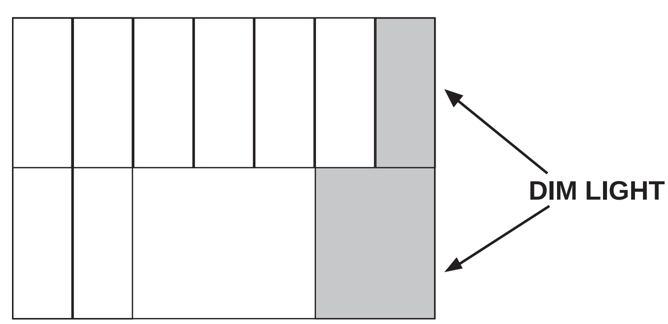
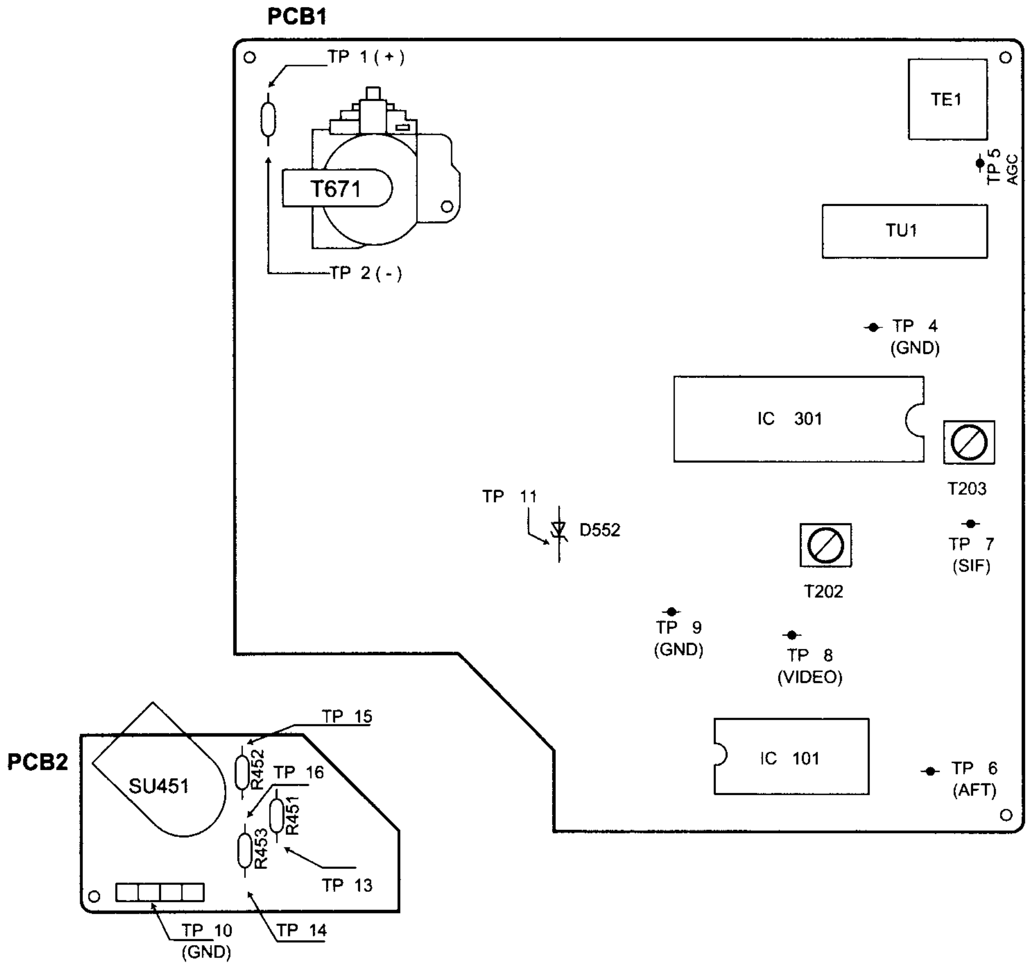


Fig. 6

TEST POINT


PCB1
TP 1 (+)
TP 2 (-)
T671
TE1
TP 5
AGC
TU1
TP 4
(GND)
IC 301
T203
TP 11
D552
T202
TP 7
(SIF)
TP 9
(GND)
TP 8
(VIDEO)
IC 101
TP 6
(AFT)
PCB2
SU451
TP 15
R452
TP 16
R451
R453
TP 13
TP 10
(GND)
TP 14

VOLTAGE CHART (all in volts)

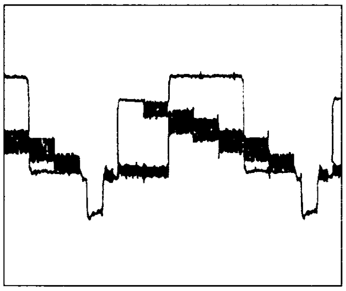
OPERATION CONDITION : TINT, BRIGHT and COLOR CONTROL……….. CENTER
CONTRAST ………………………………………. MAXIMUM
COLOR BAR SIGNAL

IC101	TERMINAL No	1	2	3	4	5	6	7	8	9	10
	Volt	4.9	0.0	0.0	0.0	5.0	5.0	5.0	0.0	0.0	0.6
	TERMINAL No	11	12	13	14	15	16	17	18	19	20
	Volt	0.0	0.0	5.0	5.0	5.0	2.3	0.0	0.0	0.6	0.7
	TERMINAL No	21	22	23	24	25	26	27	28	29	30
	Volt	0.0	0.0	0.0	0.0	0.0	3.9	4.7	4.9	4.9	0.0
	TERMINAL No	31	32	33	34	35	36	37	38	39	40
	Volt	2.1	2.3	5.0	0.0	5.0	4.5	3.1	2.0	0.0	0.7
	TERMINAL No	41	42								
	Volt	0.7	5.0								
IC102	TERMINAL No	1	2	3	4	5	6	7	8		
	Volt	0.0	0.0	0.0	0.0	2.0	3.1	0.0	5.0		
IC301	TERMINAL No	1	2	3	4	5	6	7	8	9	10
	Volt	0.0	3.8	3.0	0.0	4.6	0.0	2.0	0.7	9.0	4.4
	TERMINAL No	11	12	13	14	15	16	17	18	19	20
	Volt	6.3	4.8	0.0	0.0	4.8	4.8	4.8	3.3	2.6	2.5
	TERMINAL No	21	22	23	24	25	26	27	28	29	30
	Volt	2.3	0.8	5.1	5.2	5.6	8.3	3.0	2.0	2.1	1.0
	TERMINAL No	31	32	33	34	35	36	37	38	39	40
	Volt	0.7	1.2	6.9	5.4	0.0	2.8	3.2	3.1	3.0	6.3
	TERMINAL No	41	42	43	44	45	46	47	48	49	50
	Volt	3.1	4.9	4.7	2.4	2.0	9.0	4.0	9.0	8.4	8.2
	TERMINAL No	51	52	53	54	55	56				
	Volt	0.0	0.0	2.8	5.2	5.8	0.0				
IC311	TERMINAL No	1	2	3							
	Volt	12.1	0.0	9.0							
IC501	TERMINAL No	1	2	3	4	5	6	7	8	9	
	Volt	0.0	12.5	0.0	24.2	13.7	0.7	-0.3	1.2	23.8	
IC601	TERMINAL No	1	2	3	4	5					
	Volt	0.0	131.0	160.0	131.0	0.0					
IC671	TERMINAL No	1	2	3	4	5	6	7	8		
	Volt	10.3	0.0	5.5	0.0	0.0	5.0	0.0	5.0		

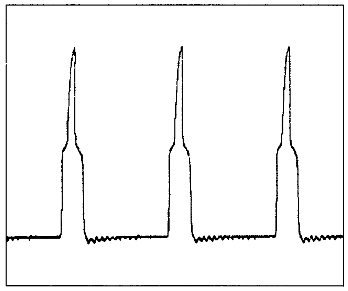
	B	E	C
	Volt	Volt	Volt
Q101	0.1	0.0	4.7
Q102	-0.7	0.0	3.9
Q173	-0.1	0.0	4.5
Q301	3.9	3.3	9.0
Q302	1.5	2.1	0.0
Q303	1.6	1.0	9.0
Q351	0.0	0.0	9.0
Q451	2.5	2.3	122.6
Q452	2.3	2.2	129.3

	B	E	C
	Volt	Volt	Volt
Q453	2.3	2.2	132.0
Q551	0.3	0.0	126.0
Q552	-0.2	0.0	-
Q601	0.7	0.0	0.1
Q801	0.6	0.0	6.7
Q802	6.7	7.4	0.0
Q803	8.0	7.4	16.0

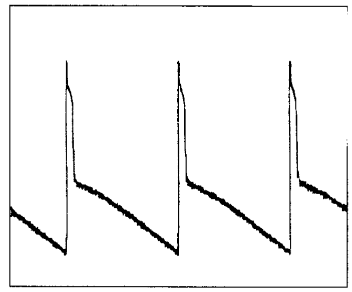
CHASSIS WAVEFORM



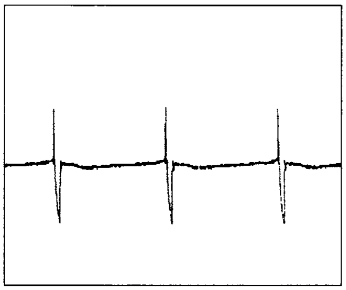
WF-1 1.1Vp-p (H)



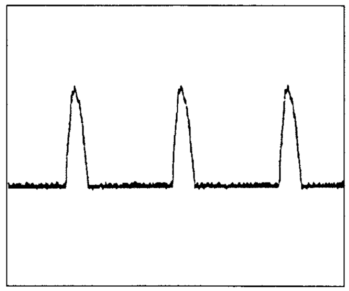
WF-2 9.4Vp-p (H)



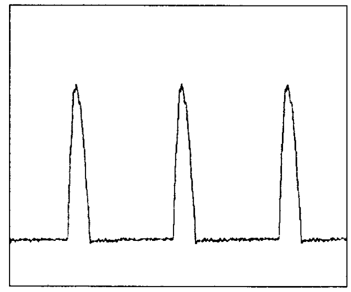
WF-3 46Vp-p (V)



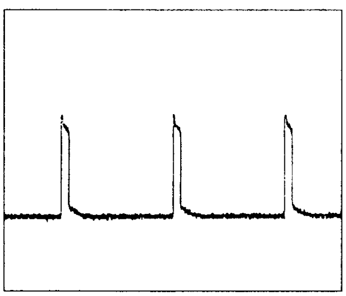
WF-4 1.4Vp-p (V)



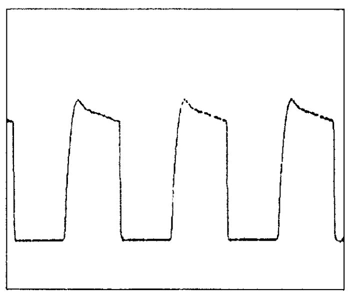
WF-5 24.8Vp-p (H)



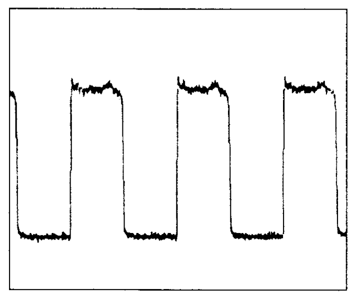
WF-5 18.8Vp-p (H)



WF-7 24.4Vp-p (V)



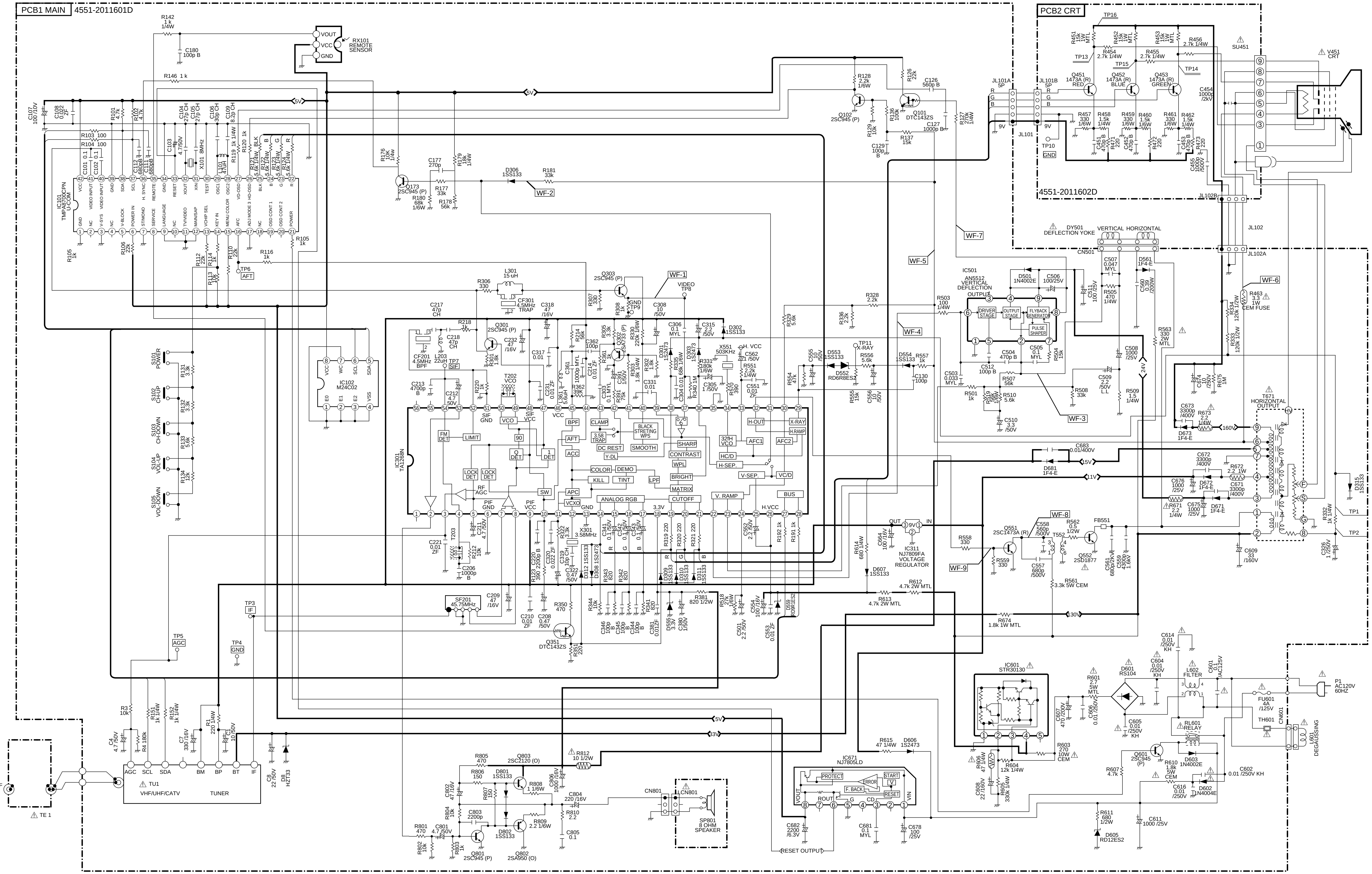
WF-8 164Vp-p (H)



WF-9 0.8Vp-p (H)

NOTES:
WAVEFORMS SHOWN WERE PRODUCED USING A PATTERN GENERATOR WITH ITS CONTROL SET TO PRODUCE A COLOR BAR SIGNAL AND A WIDEBAND OSCILLOSCOPE WITH LOW CAPACITY PROBE TO PREVENT LOADING. RECEIVER OPERATING CONTROLS WERE ADJUSTED TO PRODUCE A NORMAL PICTURE. OSCILLOSCOPE SWEEP WAS SET AT 5mS FOR VERTICAL WAVEFORMS AND 20uS FOR HORIZONTAL WAVEFORMS. PEAK-TO-PEAK VOLTAGES INDICATED MAY VARY DEPENDING ON CALIBRATION OF TEST EQUIPMENT, CHASSIS PARTS TOLERANCES AND CONTROL SETTINGS. ALL WAVEFORMS ARE TAKEN WITH WIDEBAND OSCILLOSCOPE VOLTAGES AND WAVEFORMS ARE TAKEN WITH COLOR BAR SIGNAL GENERATOR APPLIED TO THE SET.

SCHEMATIC DIAGRAM



⚠ SAFETY CRITICAL DEVICE

SAFETY CRITICAL COMPONENTS

THE DESIGN OF RECEIVER CONTAINS MANY CIRCUITS AND COMPONENTS INCLUDED SPECIFICALLY FOR SAFETY PURPOSES. FOR CONTINUED PROTECTION. NO CHANGES SHOULD BE MADE TO THE ORIGINAL DESIGN AND COMPONENTS SHOWN IN ⚠ ON THE SCHEMATIC SHOULD BE REPLACED WITH EXACT FACTORY REPLACEMENT PARTS. THE USE OF UNAUTHORIZED SUBSTITUTE PARTS MAY CREATE A SHOCK FIRE X-RAY RADIATION OR OTHER HAZARD. SERVICE SHOULD BE PERFORMED BY QUALIFIED PERSONNEL ONLY.

RELIABLE AND PERFORMANCE

FOR CONTINUED RELIABILITY AND PERFORMANCE EXACT FACTORY REPLACEMENTS ARE RECOMMENDED FOR ALL OTHER PARTS REPLACED. IF A SUBSTITUTE MUST BE USED BE SURE ITS QUALITY AND SPECIFICATIONS ARE IDENTICAL TO THE ORIGINAL PART.

SCHEMATIC DIAGRAM NOTES:

1. ALL RESISTANCE VALUES ARE IN Ω .
   k = 1000Ω . M = 1000kΩ .
2. THE WATTAGE OF RESISTORS ARE 1/8W UNLESS OTHERWISE NOTED.
3. ALL CAPACITANCE VALUES ARE IN uF UNLESS OTFHERWISE NOTED.
   p = pF = u u F.
4. ⚠ SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS. THESE COMPONENTS. MOST ONLY BE REPLACED BY ORIGINAL PARTS.